How To Make GLOBE a Meaningful Scientific Project for Your Students

GLOBE can be a terrific scientific experience for your students. Through participating in a genuine global research project, in which the investigations have been designed by scientists, they experience firsthand the excitement, the rigor, and the challenges of real science. Your students are direct participants in real scientific research. They contribute data which are used by scientists to generate new knowledge about the Earth. Through the GLOBE learning activities students can conduct their own investigations of the environment. Here are some things you can do to help make GLOBE an exciting scientific experience for your students.

Stress That the Scientists Need Your Data

The GLOBE program is unique in the degree to which scientists will actually use the data collected by students. It is, in this sense, a bold experiment. Through the design of rigorous protocols and through thorough training of teachers, the GLOBE program has tried to increase the probability that the data collected are of high quality. In the end, however, GLOBE is entirely dependent on how well you and your students carry out your data collection and follow the protocols.

We believe that students will be motivated to put out the effort to obtain quality data only if they understand the science behind the protocols, understand the importance of their data to the scientific enterprise, and support the overall research purpose. Quality data depends on quality education. The learning activities in the investigations help students obtain this quality education. Through these activities the students will learn science and mathematics concepts and skills as well as science processes. Also, they will gain understanding of the importance of precision, accuracy, and consistency in doing the protocols and of how scientists do research. Students will learn how they can pursue their own scientific investigations.

Personalize the GLOBE Scientists for Your Students

In each module we have provided photographs of the scientists who designed the investigation, an interview with the scientists, and a personal letter from them to your students. Use these materials to introduce the scientists to your students on a personal level.

On the GLOBE Web site you will find a section called the Scientists Corner. Have your students visit this page to view on-line photographs of the scientists and to read reports from the scientists about their work with the GLOBE program and other interesting topics.

Encourage Students to Contact Other GLOBE Schools

One of the exciting things about the GLOBE program is the opportunity it provides your students to meet, communicate with, and work with students in other schools around the world. Using GLOBEMail, your students can exchange messages with any school participating in GLOBE. For example, your students might ask students elsewhere to join them in carrying out a cooperative data-collection activity, enter into a collaborative research project, or exchange information about their lives and communities.

Through the GLOBE Student Data Server, your students can retrieve the data that any school has submitted. In the *GLOBE Star*s section of the GLOBE Web site, they can view schools that have been selected for special mention because of their participation in GLOBE. As the GLOBE Stars change frequently, your students should check this section regularly.

Use GLOBE Telecommunications

Your electronic link with GLOBE is through the World Wide Web. Through the GLOBE Web site, you can: obtain bulletins and updates; read background information about the program, the scientists, and other schools; submit your data; examine and retrieve data from other schools; look at graphic representations of both the GLOBE student data and other global data and

model predictions; and exchange GLOBEMail with other GLOBE schools. You will have received instructions on using the GLOBE Web site at your GLOBE Teacher Training Workshop.

Use GLOBE Science Notebooks

Encourage your students to keep a GLOBE Science Notebook, a scientific journal or notebook where each student can record all kinds of thoughts and observations. Such a notebook can be an unique mix of private and public work, a place for students to record reflections, ideas, hypotheses, questions, observations, and sketches, as well as transcribe lab results and data as they progress through their GLOBE work. We hope each student will keep a GLOBE Science Notebook.

- Set aside regular times for students to work in their GLOBE Science Notebooks during the week. If you review the notebooks periodically, you will be able to follow students' developing understanding and assess their learning.
- You might want your students to trade their GLOBE Science Notebooks with one another to learn about how other students take notes; they can attach comments to each other's work in a session on Peer Review.
- As they write in their GLOBE Science Notebooks , encourage students to be broad and daring in their reflections on their work, and persistent and careful in their transcription and use of data.
- Drawing and recording in their GLOBE Science Notebooks helps students to focus and magnify their powers of observation. No two notebooks look alike because each person needs to record information in a way that makes sense to him or her. Some people, for example, rely more on pictures than on text, whereas others prefer to capture most of their observations in numbers. Each student should experiment to find out what works best for him or her.

Each entry in the GLOBE Science Notebook should include:

- Date
- Location
- Time
- If a field entry, environmental variables such as weather
- Questions, hypotheses, methods, observations, analyses, conclusions, ideas

The information gathered in the GLOBE Science Notebook should be used to help students prepare papers and presentations on their investigations and projects. These can be presented in class, at school assemblies, and community events, and submitted to journals for publication.